Overkill: Why universities modelling the impact of nuclear war in the 1980s could not change the views of the security state

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Abstract: In the Cold War of the 1980s, Stan Openshaw (University of Leeds) and his academic colleagues produced original and sophisticated computer models which concluded that the UK government had vastly underestimated casualties and property damage in the event of a nuclear attack. The academics believed that these models would lead to policy acceptance that any military move which might provoke a nuclear attack would be unacceptable as casualties could be in the order of eighty percent. However, Openshaw was unaware that the UK government had already considered that a lower threshold of destruction would be an existential threat to the nation and were already developing authoritarian plans for national reconstruction. In conclusion, governments in crisis operate in the 'state of exception', considering state logics and brutally pragmatic forms of response that academics often misjudge in their conceptions of policy impact.

The end of the United Kingdom?

The idea that a Western nation state might not survive due to an attack by a foreign power seems to be completely alien in the present day. In the 1980s, however, the idea that the United Kingdom (UK) could cease to exist as a viable nation was debated in parliament, frequently behind closed doors in government, in military departments and even in our universities. The threat of nuclear war, it was largely argued, would mean that the UK as a

functioning state could come to an end. Whether this would occur in practice, and under what terms, was a debate which universities were engaged in at various levels. This debate was not just conducted through student societies such as local C.N.D. (Campaign for Nuclear Disarmament) groups who considered a nuclear war to be not survivable even for government. Academics, who modelled the probability of 'overkill', and the almost complete annihilation of the working population, were also involved in this analysis. In this chapter I analyse one aspect of the debate around national survival during this period, between the university scientists who modelled nuclear attack (particularly Openshaw) and the government (particularly the Home Office). In doing so I consider the work of Openshaw through his academic outputs (Openshaw and Steadman, 1983a, 1983b; Openshaw, Steadman and Greene, 1983) and how estimates of casualties and damage were reflected in the Home Office's plans for nuclear attack. In analysing the Home Office's response (which would not have been known to Openshaw) I consider a number of Home Office documents from The National Archives (TNA) from the early 1980s. The contention in this chapter is that an analysis based on emphasising the substantive impacts of nuclear war damage was unknowingly naïve given the discussions in the Home Office on what was necessary for national survival. Whilst the Home Office did care about population survival this concern was tempered by a belief that the nation state could continue in a reduced form but in a form that might be unrecognisable to academics who considered concepts of democracy and due process to be inviolable. Although the variables which defined the Home Office and university estimates were similar (casualties, fire damage and infrastructure destruction) the ultimate outcomes were different. For the university modellers their purpose was to identify the true devastation of a nuclear attack, and to critique the assumptions and methodologies of the Home Office model. For the Home Office, the task was also one of scientific accuracy but they were also minded to consider the wider purposes of state survival. This means that the Home Office considered dramatic anti-democratic and even anti-humanistic possibilities of state survival which were not dreamed of by the university critics who, whilst challenging the purposes of civil defence, did not consider that radically extreme measures might be a possibility that the state would take seriously. Therefore emphasis on the extent of devastation could not have an impact on a security state that had already considered that a much lower level of damage would be sufficient to trigger a significant existential threat and had made tentative plans to deal with this.

It must be stated that the chapter is not intended to critique the science behind the work of Openshaw and colleagues which remains as a bold challenge to the military thinkers of the early 1980s. This work was ground-breaking in terms of introducing aspects of computer modelling to unfamiliar geographical problems. Rather this analysis is intended to serve as a reminder that the concerns of the security state, in crisis, can be entirely different from those which liberal society, and particularly academics, might find to be palatable in terms of democracy and due process. The experimental, brutal, pragmatism conducted behind closed doors in the Home Office of the 1980s was such that notions of academic impact (at least in terms of increasingly horrific casualty estimates) would have little effect. Unknown to Openshaw, the effective tolerable limit for UK national survival had already been breached within Home Office assessments even without his new estimations.

It is important to separate a theorised perspective – that modern government is brutally pragmatic in the 'state of exception' (Agamben, 2005) - from conspiracy theories. It is often considered that the government departments of the period were using civil defence and models of nuclear survival to mislead the general public whilst keeping the true models of nuclear attack to themselves. This conspiratorial perspective affords too much agency to the state. Firstly, with regard to civil defence and modelling of civilian casualties the state is subject to strong path dependence in terms of how interlocking agencies constrain (and sometimes enhance) policy direction. In terms of the British state, for example, the government had a historical tendency towards secrecy over matters of civil defence, nuclear war and the collapse of national infrastructures which was very different to the more open, civil society, approach that prevailed in the United States (Kitagawa, Preston and Chadderton, 2016). There was little openness in terms of discussing nuclear, or military matters, with academics in the 1980s. However, suppression of information was not necessarily a common purpose across government departments. Again, in the UK while some departments (Ministry of Defence and the Foreign and Commonwealth Office) wished to maintain civil defence secrecy in the 1980s, others (such as the Home Office) desired a more open and widely disseminated policy but their limited strength in Cabinet gave them little success (Preston, 2014). It would therefore have been very difficult for part of the state in the 1980s to break with previous policies of secrecy, particularly with opposition from other government departments. Secondly, given the circumstances of absolute nuclear annihilation the state was hugely conflicted in terms of its aims in terms of prioritising its own survival as opposed to the survival of citizens. It faced a truly existential crisis not just of life but of the

existence of the nation. The state was not necessarily consciously keeping the public in the dark about nuclear war and civil defence (although internal pressures from the Ministry of Defence would lead the British State to behave in this way) but literally had very few options in terms of the extent of devastation it was facing.

Modelling nuclear attack: the work of Openshaw

The work of Stan Openshaw, an early pioneer of computational geography at the University of Leeds, and his academic co-author Philip Steadman, on nuclear war in the early 1980s, provided an academic rebuttal to civil defence guidance of the time, particularly *Protect and Survive* (H.M.S.O., 1980). Additionally, it can be positioned alongside forms of protest that sought to dismiss the government's efforts to defend the population under nuclear attack arising from C.N.D. and other counter-cultural movements. Openshaw's work was not politically motivated, and in principle not oppositional to the concept of civil defence, but rather aimed to provide a robust academic assessment of casualties and damage following a nuclear attack. In producing the 'Openshaw-Steadman nuclear war casualty prediction models' (Openshaw and Steadman, 1983b, p.197) they aimed to provide academic objectivity in an area where they saw that the public had often been misled. In particular, they aimed to bring a spatial analysis to the science of casualty estimation (Openshaw and Steadman, 1983b, p.201).

Openshaw and Steadman (1983a) believed that university academics had not been particularly concerned with the mostly secretive nuclear attack models devised by government. They wanted to question the estimates arising from these nuclear models as an area where academics could make an impact on public debate as opposed to the secrecy of government through which 'The public, it seems are not to be told about the risks they face…' (Openshaw and Steadman, 1983a, p.206). In critiquing these models they aimed to use the methods of urban and regional modelling to test the military assumptions of governments. Although Openshaw, Steadman and Greene (1983) made it entirely clear that the extent of their analysis tended towards the apocalyptic by entitling their work on the chances of the UK surviving a nuclear attack 'Doomsday' their task was scientific objectivity. Whilst acknowledging that other studies of such attacks might exist in the MOD (Ministry of Defence) or the Home Office (Openshaw, Greene and Steadman, 1983, p.1) they had not been made available to the public. What they could do was to consider what little

they knew about the assumptions behind the computer modelling at the Home Office to compare it to their own modelling. The results of Openshaw *et al's* (1983) investigation was sobering:-

> '…even a moderate, realistic, level of attack would be likely to result in at least four-fifths of the country's population being killed and injured by the direct effects, 65 per cent of all buildings in the country being seriously damaged, set on fire or demolished, and 70 per cent of the inhabited land are of Britain being subjected to levels of radiation from fallout which would be fatal to any person (and most animals) in the open' (p.5)

The authors considered that this analysis was more rigorous than that undertaken by the Home Office. The computer model devised by Openshaw was sophisticated for 1983 and the analysis was conducted in the FORTRAN language on a main frame computer (IBM 370/168) which had eight megabytes of memory. The IBM 370/168 was a computer in wide use at that time including in the United States Department of Defence (Department of Defense, 1978) so it was possible to imagine that governments would be conducting analysis on similar machines. The procedure that Openshaw adopted involved dividing the UK into discrete squares of one kilometre in area. This segmented the country into roughly a quarter of a million squares which were then allocated an aggregate population based on 1971 census data. Bomb targets, related to government planning assumptions, were based on Ordnance Survey maps allocated to the quarter of a million squares and each bomb target had attributes for the expected missile including yield and groundburst / airburst, which then allowed for the calculation of casualties, blast damage and other effects (Openshaw, Greene and Steadman, 1983, p.113) to provide (in a moderate case) the grim statistics described above. The authors considered that their model was robust. In contrast, the Home Office model used '…inappropriate data and overoptimistic assumptions' which meant that it '…predicts very much lower casualty estimates than ours' (Openshaw, Greene and Steadman, 1983, p.197). Their criticisms were based upon various omissions by the Home Office (in not accounting for thermal radiation burns, in not assuming that successive attacks might be more damaging given previous damage to shelter) and underestimations (in underestimating blast pressure, in assuming that properties can be similarly protected against damage and in minimising the impact of radiation dose) in the model. In other work, they reported that blast effects had been substantively underestimated by the Home Office (Openshaw and Steadman, 1983a,

p.218). They conceded that their models were beset with uncertainties, but that the bias in their models was downwards in terms of casualties and once other factors were taken into consideration including lack of resources, disease, famine, spread of fallout from the continent and attacks on nuclear power stations the effects of the damage would be much greater. In terms of modelling their most extreme, but technically viable, nuclear attack scenario 'Hard Luck' predicted that the survival rate of the population after two weeks would only be 20% at the *maximum*.

Hard Luck: The Home Office and societal continuity

Openshaw had an expectation that scientific objectivity from a university source would be invaluable to 'Emergency Planning Officers, DHSS…[Department of Health and Social Security]…'war-planners', Home Office scientific advisers and other civil defence workers' (Openshaw, Greene and Steadman, 1983, p.6) and that such objectivity would lead to those groups reconsidering the viability of civil defence. Their advice, they believed, could even lead to a rethinking of decisions under crisis to reduce the possibility of nuclear war (Openshaw and Steadman, 1983b). Indeed, there was a similar view amongst Home Office scientists, who did consider that the prospects for the country in a nuclear attack looked bleak, but how the Home Office defined that problem was markedly different to what Openshaw expected. What critics such as Openshaw underestimated was that the Government had very different (actually lower) criteria for what was meant by national survival in a nuclear war. However, this did not mean that the government was wholly cynical concerning civil defence. In the conclusion to their book, Openshaw, Greene and Steadman (1983) make two conclusions regarding civil defence and the aims of the state:-

> '…the number of short term-deaths and injuries averted at present precautions would be very few in comparison to the total death toll…defence of the population is only one of their concerns and a minor one at that' (p.242).

In these two statements Openshaw et al. and the Home Office would be primarily in agreement although the academics would not have known it at the time. That was because the Home Office was concerned about the scale of the attack and the efficacy of civil defence but their concerns were wider than defence of the population. Indeed, the claim that Openshaw and Steadman (1983a) make that 'It is very questionable whether any kind of

recovery, or partial recovery would be possible after a large-scale nuclear attack' (Openshaw and Steadman, 1983a, p.224) was almost identical to the thinking of social scientists commissioned by the Home Office (Preston, 2014). Even if the population as a whole did not survive then the survival of government, and the continuity of the nation state, was considered to be important. Home Office social scientists believed that it was quite likely that the UK population would be too physically and psychologically damaged to consider reconstructing a nation state and that the chances of a viable nation surviving a nuclear attack was in the balance. There was a real, and scientifically substantiated, fear by the Home Office that even a nuclear attack that resulted in a small number of casualties in an area would result in a society that could not rebuild itself (Preston, 2014).

To expand on this point, social scientists, and psychologists who were employed by the Home Office to construct reports on the prospects for national survival were convinced that, without a significant change in the basic structures of society in the UK, there was little chance that there could be regeneration to a fully functioning nation state. In the computer model of nuclear attacks devised by Openshaw and Steadman (1983b) two scenarios were proposed - 'Hard Rock' (based on a real 1982 Home Defence exercise) in which up to 350 MT (Megatons) of nuclear weapons hit the UK without strategic targeting and the more realistic (according to Openshaw and Steadman) 'Hard Luck' where weapons are more strategically targeted. In 'Hard Rock' 80% of the population would survive a fortnight, whereas in 'Hard Luck' only a maximum of 20% would be alive after two weeks. The Home Office considered that *even* an attack of the 'Hard Rock' type (with 20% casualties) would result in the prospects for economic and social regeneration being severely compromised (Home Office, c.1982a). Moreover, in areas where casualty rates were above 50% it was predicted that the region would effectively be *eternally lost* in terms of the ability of citizens to achieve social reconstruction (Home Office, c.1982a). A 'Hard Luck' scenario was beyond the bounds of what the Home Office considered reasonable for the UK to ever recover from socially or economically. Even 'Hard Rock' was an ontologically different type of disaster, a 'macro disaster' (Home Office, c.1982a) with macro-social consequences in terms of permanently destroying social cohesion. 'Hard Luck', although worse, did not change things for the Home Office as social cohesion, and national survival (in the terms we recognise it) were already compromised.

Openshaw and colleagues at Leeds University did not know it but their modelling already represented 'overkill' in terms of how the Home Office was thinking about prospects for societal reconstruction after nuclear war. Although technically useful, and provocative to the general public, there was no possibility of this research changing minds in the Home Office as it was already conceded that an attack of much lower magnitude predicted by the scientists would mean the end of the UK as a plausible nation state. In these circumstances, the Home Office set about to consider how a nation could be reconstructed in terms beyond which would be democratic or necessarily humanitarian with the emphasis on a scientific pragmatism. Foreshadowed by the grim advice in 'Protect and Survive' (HMSO, 1980) which included burial of the dead, plans for subsequent advice would highlight that civil defence was necessary primarily to prevent death (Home Office, 1982). As the psychological demands on the population would be so traumatic as to make recovery through standard legal and economic systems impossible (Home Office, c.1982b) the Home Office experimented with alternative methods of social control. One of these was the imposition of martial law with a return to the death penalty for transgressing activities which would hamper recovery (Home Office, 1982b). In one exercise ('Exercise Regenerate') it was even considered that psychopaths, due to their lack of empathy and lack of qualms around using violence, could make excellent recruits to the police and other agents of social control (Home Office, c.1982c). Their lack of moral code was believed to be advantageous to the types of social control which would be necessary after a nuclear war. Another strategy was to strategically use food stocks to force the population to work for reconstruction, albeit at starvation rations. It was predicted that a nuclear attack on the scale of 'Hard Rock' would destroy agriculture for years and that there was no possibility of food stocks feeding the population even in the short term (Home Office, 1984). In these circumstances it was planned only to provide subsistence rations to obedient workers, the police and the military for the purposes of social and economic reconstruction (Campbell, 1982, p.279).

In summary, the Home Office had already considered that the magnitude of a nuclear attack even on a scale less extreme than that modelled by Openshaw et al would be enough to put the UK into a major risk of existential threat. In those circumstances there could be no conception of survival of a nation under conditions of democracy or capitalism. The nation would need to survive by other means. Accordingly, the state conducted thought experiments which would recommend feudal types of feeding and law enforcement and even suggested the use of psychopaths as agents of the state. This authoritarian pragmatism on behalf of the

Home Office was what would apparently be required if the task was to restore the UK to any notion of a functioning nation state.

Conclusion: the practice of security under existential threat

The nuclear attack modelling being conducted by Openshaw and colleagues in the 1980s was being carried out without awareness of the fact that there was a very private government discourse. Where there were reports that government had tried to make plans for the provision of food for the population (for example) the ludicrous nature of such plans (that they would never keep a person alive) were taken to be evidence that such plans were unrealistic and 'fantasies'. The truth was that these plans reflected pragmatism on the part of government, a state perspective that (in the final analysis) would be reluctantly prepared to sacrifice some of its barely surviving citizenry rather than to lose the nation. The wider ideal, of national continuity, was considered to be the ultimate goal of government. I refer to this as the 'collapsible state' (Preston, 2009), a state that can consolidate until sufficient power has been restored to rebuild a full and functioning government. A 'collapsible state' divides the 'core state' (survival of central government with sufficient force to maintain continuity) from its functions and even its population. This is not to imply some kind of notion of 'deep state'. Although some academics were occasionally brought into the periphery of the state so that their work on social and psychological robustness could be used they were never party to the activities of the 'core state'. It is here that concepts of welfare, democracy and ultimately citizenry can be abandoned for the protection of the sovereign state. The state displays a ruthless pragmatism in relating to its population for its continued survival, or at least the survival of the nation.

Whilst the debate conducted by Openshaw and his authors was constructed with a belief that knowing the true extent of a nuclear war would alter public minds and public policy, in reality the Home Office had already considered that a substantially lower rate of destruction than Openshaw had predicted would, in any case, result in an existential threat to national survival, or at least the survival of the nation state. In these extreme circumstances, the state's notion that it needs to protect the welfare and security of its citizens disappears, alongside ideas of justice and social justice (Preston, Chadderton and Kitagawa, 2014). In doing so the state experiments with new regimes of security that are not necessarily democratic whilst attempting to insert these into existing democratic legal structures (through

planning for states of emergency) so that in the event of a crisis these can be deployed. The experimental nature of a 'post-nuclear' state of exception in the United Kingdom can be conceptually related to Agamben's (2005) division between application and norm in the 'state of exception':-

> '…the state of exception is the opening of a space in which application and norm reveal their separation and a pure force-of-law realises…In this way, the impossible task of welding norm and reality together, and thereby constituting the normal sphere is carried out in the form of the exception...In every case the state of exception marks a threshold at which logic and praxis blur with each other and a pure violence without logos claims to realize an enunciation without any real reference' (p.40)

The boundaries in which state security operates, in times of crisis, operate in the threshold at which 'logic and praxis blur'. In an ultimately existential threat, conceptions of the logics of welfarism, democracy and due process are instantly anachronistic to the state which returns to the practical and pragmatic. Today we might consider that conceptions of martial law, subsistence rationing, using food for social control and recruiting psychopaths to the police are absurd notions. For the plausibly post-nuclear British state in the 1980s, though, these were concrete, if experimental suggestions. The question became one of a practical, free thinking, political philosophy in terms of how a nation state is constructed not just following war or crisis, but following an apocalyptic event. The contemporary lesson is that for academics in universities who wish to inform state policy on security there needs to be awareness, and a lack of naivety, concerning the strategic pragmatism of the state, particularly in crisis. Academics tend to believe that if they produce technically sophisticated, objective, research that shakes assumptions then it will be adopted in policy and practice. In the UK, in particular, there is an emphasis by universities and funding councils on the importance of research impact, especially in terms of UK government policy. However, as has been shown the ground-breaking technical work of Openshaw and colleagues in modelling the impact of nuclear attack could not change the views of the Home Office as they were already though the looking glass, operating in Agamben's (2005, p.40) '…threshold at which logic and praxis blend with each other'.

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